

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 27 FEB 2006

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Applicant's or agent's file reference 63514A		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/US2005/008458		International filing date (day/month/year) 15.03.2005	Priority date (day/month/year) 16.03.2004	
International Patent Classification (IPC) or national classification and IPC C08J5/08, C08L25/08, C08L25/10, C08L25/12				
Applicant DOW GLOBAL TECHNOLOGIES INC. et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  15.08.2005		Date of completion of this report  23.02.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  West, N  Telephone No. +49 89 2399-7582		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2005/008458

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements**\* of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-8 as originally filed

**Claims, Numbers**

1-13 filed with telefax on 15.08.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
    - ☐ the description, pages
    - ☐ the claims, Nos.
    - ☐ the drawings, sheets/figs
    - ☐ the sequence listing *(specify)*:
    - ☐ any table(s) related to sequence listing *(specify)*:
  4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
    - ☐ the description, pages
    - ☐ the claims, Nos.
    - ☐ the drawings, sheets/figs
    - ☐ the sequence listing *(specify)*:
    - ☐ any table(s) related to sequence listing *(specify)*:

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-13
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

Reference is made to the following documents (**D**):

- D1:** US-A-4 473 616 (RADEMACHER ET AL) 25 September 1984 (1984-09-25)
- D2:** DE 100 55 190 A1 (BASF AG) 16 May 2002 (2002-05-16)
- D3:** WO 01/02471 A (FACT FUTURE ADVANCED COMPOSITES & TECHNOLOGY GMBH; LINDNER, MATHIAS) 11 January 2001 (2001-01-11)
- D4:** WO 01/60899 A (GENERAL ELECTRIC COMPANY) 23 August 2001 (2001-08-23)
- D5:** US-B2-6 627 692 (SAITO KOICHI ET AL) 30 September 2003 (2003-09-30)

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. **Novelty:**

The subject-matter as presently claimed in claims 1-13 is new with respect to the disclosures of **D1**, since **D1** does not disclose that the compositions must contain at least two different polystyrene polymers.

Document **D2** discloses in its claim 4 that the substrate may comprise various types of polystyrene polymers, or their mixtures. Furthermore, **D2** discloses in its examples the use of long glass fibres with a length of either 4 or 13mm, i.e. thus falling within the range as claimed in present claims 1 and 13. It is to be noted, that since **D2** discloses the use of mixtures of different types of polystyrenes, it must follow that one polystyrene is stiffer than the other. Furthermore, the application does not contain any explanation to as which melt flow viscosities is to be understood under the term "high flow", which is why this feature cannot be regarded as representing a limitation. However, since in order to arrive too the subject-matter as presently claimed would imply a multiple amount of choices (i.e. choosing two different types of polystyrenes, and supplementary choosing a mixture of these), the subject-matter as presently claimed must be regarded as being formally novel over the disclosures of **D2**.

**D3** does not disclose a mixture comprising two different polystyrenes (it only discloses that the first polymer present in the mixture must be a polystyrene), which is

why **D3** cannot anticipate the novelty of the present claims.

**D4** discloses in its claim 1 a composition comprising rubber material which according to claim 4 comprising a polystyrene unit (i.e. thus being a first high flow polystyrene as required in present claim 1) and its admixture with polystyrene (since PS is a thermoplast it must be stiffer than the rubber material), and the further admixture of glass fibres diameter of 14 micrometers (see page 11, line 6). **D4** does not explicitly or implicitly disclose the use of long glass fibres, which is why **D4** cannot anticipate the novelty of the present claims.

**D5** does not disclose the use of mixtures comprising at least two different polystyrenes.

Consequently, the subject-matter must be regarded as being novel over the cited prior art (Article 33(2) PCT).

**2. Inventive Step:**

Document **D2** can be regarded as representing the closest prior art.

In view of the disclosures of **D2** it must be noted, that the objective problem to be solved by the present application must be regarded as merely representing an alternative, since the applicant has in no way shown (i.e. in the form of appropriate comparative tests), that such a choice leads to any unexpected technical effect. The applicant has merely shown that the choice of long glass fibres is beneficial, however, since **D2**, just like the present application, already discloses the use of such fibres, it must be stated that all these beneficial effects, have already been accomplished by the compositions of **D2**.

**D2** explicitly suggests using various mixtures of polystyrene polymers, however, the person skilled in the art, would have regarded it as merely routine variation to follow the suggestions made in a document, especially when not expecting any technical effect.

Consequently, the subject-matter as presently claimed in claims 1-13 cannot be

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(SEPARATE SHEET)**

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regarded as involving an inventive step (Article 33(3) PCT).

## Revised Claims:

1. A method for producing a long glass fiber-reinforced thermoplastic resin composition, the method comprising the steps of:

selecting a quantity of long glass fiber having a length of 3.0 mm to 30 mm;

5 adding the selected quantity of long glass fiber to a first styrenic copolymer to form a master-batch, said first styrenic copolymer being a high flow copolymer; and

blending the master-batch with a second copolymer comprising a stiffer flowing amorphous styrenic copolymers.

2. The method in accordance with Claim 1 wherein said first styrenic  
10 copolymer is selected from the group consisting of styrene-acrylonitrile (SAN), acrylonitrile-butadiene-styrene (ABS), and an alloy of ABS resins.

3. The method in accordance with Claim 1 or 2 wherein the second  
copolymer is selected from the group consisting of acrylonitrile-butadiene-styrene (ABS),  
styrene-maleic anhydride (SMA), acrylate styrene acrylonitrile (ASA), PC/ASA, PC/ABS,  
15 and PC/SMA.

4. The method in accordance with any one of Claims 1 to 3 wherein the second copolymer blends with the first copolymer to form a homogeneous blend.

5. The method in accordance with any one of Claims 1 to 4 wherein the selected quantity of glass fibers is added to a high flow of the first copolymer.

20 6. The method in accordance with any one of Claims 1 to 5 wherein the selected quantity of glass fibers is added to the first copolymer in such an amount so that the resulting master-batch has a glass fiber concentration of between 40 percent and 75 percent.

7. The method in accordance with any one of Claims 1 to 6 wherein the blending ratio of the masterbatch with the second copolymer is between 10 and 40 percent about 10 percent and 40 percent.

8. The method in accordance with any one of Claims 1 to 7 wherein the  
5 long glass fiber is glass roving.

9. The method in accordance with any one of Claims 1 to 8 wherein the master-batch is dry-blended with the second copolymer.

10. The method in accordance with any one of Claims 1 to 9 wherein the second copolymer is a neat mass acrylonitrile-butadiene-styrene (ABS) resin.

10 11. A glass fiber-reinforced thermoplastic resin composition comprising:  
glass fiber having a length of 3.0 mm to 30 mm;  
a first styrenic copolymer, comprising a high flow copolymer selected from the group consisting of styrene-acrylonitrile (SAN), acrylonitrile-butadiene-styrene (ABS), an alloy of ABS resins and a polycarbonate; and  
15 a second styrenic copolymer having stiffer flow properties selected from the group consisting of acrylonitrile-butadiene-styrene (ABS), styrene-maleic anhydride (SMA), arylate styrene acrylonitrile (ASA), PC/ASA, PC/ABS, and PC/SMA.

12. The glass fiber-reinforced thermoplastic resin composition of Claim 11 wherein said glass fiber is glass roving.

20 13. The glass fiber-reinforced thermoplastic resin composition according to Claims 11 or 12 wherein said second styrenic copolymer is a neat mass acrylonitrile-butadiene-styrene (ABS) resin.